A Social Dilemma Analysis of Contribution to Knowledge Management

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A Thesis Submitted in Partial Fulfillment

of the Requirements for the Degree of

Master of Philosophy

in

Industrial-Organizational Psychology

August 2007

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Abstract of thesis entitled:

A Social Dilemma Analysis of Contribution to Knowledge Management

Submitted by HO, Tin Man Flora

for the degree of Master of Philosophy in Industrial and Organizational Psychology

at The Chinese University of Hong Kong in August 2007

Knowledge management (KM) is a system of sharing and storing knowledge. The current study investigates individuals' contribution of knowledge to KM from a public goods dilemma framework. Public goods dilemma refers to a situation in which an individual faces a conflict between maximizing one's own gain versus collective gain. Knowledge can be viewed as a type of public goods as it is infinite in supply and knowledge consumption by a user will not affect others' use. We hypothesized that likelihood to contribute to KM is associated with individual characteristics including (a) intrapersonal factors such as self-efficacy and vested interest and (b) interpersonal factors such as expectations, fear and greed. We also hypothesized that external factors like (c) organizational factors such as conformity pressure, shadow of future and anonymity are associated with contributions to KM. A questionnaire survey was administered to 202 employees in Hong Kong to examine how these factors affect KM contribution. The results showed that factors

contributing to past behaviors and future intentions were different. Self-efficacy and fear were found to predict participants' past behaviors while vested interest affected future intentions to engage in KM activities but not past behaviors. Organizational factors were not significant predictors of both past behaviors and future behavioral intentions to engage in KM activities.

摘文

知識管理之所以能實行是建基於知識可以和別人分享的特質。分享知識的方法大致可分爲兩種，第一種是以文字把知識紀錄下來，儲存在資料庫，第二種是由一個人把知識傳遞給另一個人，以人作爲媒介。本研究以社會兩難的架構探討能影響個人在知識管理中分享自己知識的因素。公共物品兩難是指個人遇到不分享以擴大個人利益或分享以擴大公眾利益的兩難局面。知識可被視爲一種公共物品，因爲知識可以無限量供應，而一個人運用知識時不會影響別人運用知識時的利益。從公共物品兩難的研究中的因素，我們假設個人在知識管理中分享的可能性與個人特質有關包括：(1) 個人內在因素 (自我效能(self-efficacy)和既得利益(vested interest)), (2) 人際因素 (期望(expectation)、恐懼(fear)和貪念(greed))。除此之外，我們也假設外在因素也與個人在知識管理中分享的可能性有關包括：(3) 機構因素 (順從性(conformity)、未來合作的可能性(shadow of future)和匿名性(anonymity))。本研究通過對 202 位工作者的問卷調查，探討了這些因素如何影響知識管理行爲。研究結果顯示影響過去行爲及未來行爲意向的因素並不相同，自我效能和恐懼能預測過去行爲，而既得利益能預測個人在未來的行爲意向，但不能估計過去的行爲，機構因素則未能預測過去行爲或未來行爲意向。

Acknowledgement

My deepest thanks must go to my supervisor, Dr. Winton Au Wing Tung who has given me his generous support and guidance throughout these few years. I would also like to thank him for his time, effort and patience with me as well as his good advice on my study. Without him, I would not be able to complete this thesis.

I would also like to express my sincere gratitude to Prof. Chan Wai and Prof. Darius Chan for their invaluable advice for my thesis as well as their guidance during these two years of study. Last but not least, may I express my heartfelt thanks to Miss Vivian W. S. Lam, Miss Janice W. S. Hui, Miss Ellis P. M. Yeung, Miss Kathleen C. C. Yu, Miss Kary S. K. Wong and Miss Noel Y. S. Wong for their continuous support and generous help.

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CHAPTER 1. INTRODUCTION

Knowledge management

Organizational learning has become a popular topic within different research areas (such as management, uit Beijerse, 1999). As the world is turning into a knowledge-based economy, organizations start to realize the importance of keeping up with the pace of emerging knowledge. Knowledge management (KM) could help manage the sharing of knowledge within the organizations. KM is not a new concept. As in the old days, masters of many industries such as bakers or tailors would pass on their tacit knowledge to their apprentices and the traditional family business would pass on their business wisdom to their descendants (Hansen, Nohria, & Tierney, 2001). As the economy becomes more knowledge-intensive as well as the number of family businesses decreases, knowledge sharing within an organization becomes a critical competitive advantage that organization could have over others (Hansen et al., 2001; Wiig, 1997).

The concept of KM builds on the fact that knowledge can be personalized or documented for future use (Hansen et al., 2001). Codification of knowledge is suitable for organizations that provide standardized products or services, thus they can store the knowledge or information into their database for future use. On the other hand, the personalization of knowledge, the second type of KM, refers to the

person-to-person transfer of knowledge. It is more appropriate for organizations that provide highly customized solutions or products for customers. As there would be a unique solution for every problem, it is difficult, if not impossible, to organize the information into a database for future use, thus that tacit knowledge would be better transferred through face-to-face communication between employees.

Hansen et al. (2001) conducted research on KM systems within industries including consultancy firms, health care organizations and computer companies. It was found that the best way to manage knowledge is to choose either codification or personalization while using the other one as a supplement. Blindly focusing on only one strategy or relying on both strategies to the same degree would undermine the business of the company.

When considering the choice of strategies, organizations have to take into consideration a few questions (Hansen et al., 2001). First of all, as mentioned before, the choice should depend on the type of products, whether it is uniformly standardized or specifically customized for its clients or customers. Secondly, whether the products are mature or innovative. Finally, what knowledge employees rely on when they work, whether the tacit knowledge or explicit knowledge must be considered. Nevertheless, it is possible that a company would change its choice of strategy along with its development. Hansen et al. suggested that an effective

organization would be able to stick to one strategy. Apart from choosing the appropriate strategy of KM, there are other factors affecting the efficiency of KM.

The success of KM depends on many factors and the most important one is the motivation of participants who share information (Ardichvili, Page, & Wentling, 2003). Dixon (2000) has found that some participants were reluctant to share information in the KM system but they were willing to exchange information with colleagues when they were asked informally. Thus it is crucial to derive the underlying motivators which could encourage employees to share their knowledge. Between the intrinsic or extrinsic motives, research suggests that intrinsic motives (e.g. raising self-esteem or altruistic considerations, McLure & Faraj, 2000) are more powerful in motivating people to participate in a KM system (Osterioh & Frey, 2000).

Xu and Quaddus (2005) studied the factors affecting the diffusion of KM systems. Diffusion of KM systems refers to the initiation, adoption, pilot implementation, organic growth, organizational implementation and diffusion of KM system. They categorized the factors into different groups, including external inspiring factors, individual factors, task complexity, organizational factors, management support and KM system characteristics. They proposed that such factors would affect individual's perception of KM system, for example, whether the

individuals could voluntarily participate in the KM system, the perceived usefulness and user-friendliness of the KM system and the subjective norms about the use of the KM systems, which would influence the diffusion of KM system within the organizations.

The present study aims to investigate the factors affecting individuals' willingness to contribute in KM using a social dilemma perspective. This is a new perspective within KM research. The factors affecting people's willingness to contribute in a social dilemma will be discussed first in the next section.

Social Dilemma

Social dilemma refers to a situation in which a person has to decide whether to maximize his or her own gains or to maximize collective gains (Van Vugt, 2002). Public goods dilemmas are one type of social dilemma. A public good is a good that could be enjoyed by consumers even if they do not contribute anything. However, if no one contributes, there will no public good to begin with (van Dijk, Wilke & Wit, 2003; De Cremer & van Knippenberg, 2003). One example would be the case of Wikipedia. By contributing knowledge on different terms, the Wikipedia could provide a database of meanings of different terms. However, if no one contributes to the database, Wikipedia would be empty and would not be useful to anyone.

Research shows that the information within KM could be regarded as a public

good (Ardichvili et al., 2003). Knowledge could be enjoyed by all members within the organization. However, if no member is willing to share or contribute his or her knowledge with others, no information would be shared among employees and no one could gain the benefit of information sharing. This paper tries to consider the similarities and fit the framework of social dilemma in explaining individual's willingness to contribute to KM. Thus, this paper aims at investigating the factors affecting individuals' choice in taking part in KM behaviors using a social dilemma perspective. The factors would be grouped into 2 levels: individual and organizational factors.

Factors affecting people contributing to KM

Individual factors

The factors, which affect the perceptions and attitudes of individuals towards the public goods, the knowledge, are grouped into this category. They are further divided into 2 categories: (i) intrapersonal factors, which exist within the individual and (ii) interpersonal factors, which involves the interaction between individuals. The intrapersonal factors include Self-efficacy and Vested Interest of the participants of KM. The interpersonal factors include the Expectations of individuals towards others' behaviors, the Fear of being a sucker and the Greed to not contribute.

Intrapersonal factors

Self-efficacy

Self-efficacy is an important factor in determining whether people would contribute in a public goods dilemma (Komorita & Parks, 1994). Having a high sense of self-efficacy would encourage one to believe that one is able to influence the situation. If individuals do not believe that they could influence the outcome of the situation, they would tend not to act out the behavior, for example, not contributing in a public goods dilemma (Messick, 1973; Olson, 1965). Similarly, within KM, if individuals do not believe that their contribution of knowledge could help other colleagues in the organization, they would be less likely to transfer the knowledge to others.

H1: Having high self-efficacy in usefulness of own knowledge for others will enhance individuals' (a) participation and (b) intentions to participate in KM activities.

Vested interest

Within a public goods game, participants would be more willing to contribute if they receive a larger payoff from the game (Issac, McCue, & Plott, 1985). That is,

individuals who believe that the good is important to them would be more likely to contribute in a public goods dilemma. When we apply this finding into the case of KM, we would expect that employees who could gain more benefit from knowledge sharing and those to whom the importance of knowledge is high would be more willing to contribute and share their knowledge with others as they might view themselves to have more to gain.

H2: Individuals to whom the knowledge shared in KM is relatively more important will be more likely to (a) contribute their own knowledge and (b) have higher intentions to do so.

Interpersonal factors

Expectations

Individuals would be more willing to contribute if they expect others would also contribute (Komorita & Parks, 1994) because a favorable outcome would be more likely to be obtained, that is, the goods could be maintained longer if more people contribute in a public goods dilemma. As employees in an organization would have certain degree of contact with colleagues, they would form an expectation about how much other colleagues might engage in KM activities. The study of Rapoport and Eshed-Levy (1989) showed that individuals tend to assume

others as the same as themselves. That is, individuals see others as having the same social value orientation as them. Thus, having a contributing social value orientation would encourage the individuals to share their knowledge as they would expect others to do so.

Apart from assuming that others are similar to themselves, other researchers have proposed that cooperators would view their partner in terms of morality whereas individualists would tend to perceive their partners in terms of power (Liebrand, Wilke, Vogel & Wolters, 1986). This is known as the might-versus-morality hypothesis. This hypothesis implies that the social value orientation of individuals could affect how they interpret the situation they are facing, and thus impact their choice in a social dilemma.

The expectations about opponents would also affect the individuals' willingness to contribute. Kerr's (1983) study has shown that if participants expect the opponent to be a free-rider, they will be less likely to contribute to the public good. This is known as the sucker effect, which refers to the situation in which an individual does not want to contribute because he or she does not want the free-riders to enjoy the goods even if it could be successfully provided (Kerr, 1983; Orbell & Dawes, 1981). Thus individuals would share information only if they perceive others would share their knowledge also.

H3: Individuals who expect other members to contribute information will be more likely to (a) contribute their knowledge and (b) more intend to contribute in the future

Fear and greed

Fear and greed are two powerful influences that discourage individuals from contributing to the public goods. Research has shown that these two factors affect individuals' contributing behavior in public goods games (Dawes, Orbell, Simmons, & van de Kragt, 1986; Rapoport, 1987). Participants in a public goods dilemma fear that they would be a sucker as the free-riders could enjoy the public good even if the free-riders had not contributed (Komorita & Parks, 1994). In addition, they may fear that even if they contribute, if others free-ride, there would be insufficient resources for the public goods to be provided. This would be the fear of wasting resources one contributed.

Within KM, the fear induced might be the fear of being a sucker, that is, others free-ride by not sharing knowledge with oneself. Without others' contributions, one would be taken advantage of if one contributes by sharing his or her knowledge only.

H4: Individuals' (a) unwillingness to contribute or (b) lower intentions to contribute to the KM system will be due to the fear of being a sucker.

On the other hand, greed is another obstacle hindering individuals from contributing. Individuals would be greedy when they want to have the share from the public goods while keeping their own endowments (Komorita & Parks, 1994). When applying to the case of KM, individuals are tempted to free-ride by asking for information while not sacrificing time to share information with others.

H5: The greed of individuals to take without giving will lead individuals to be (a) not willing to and (b) no intention to participate and contribute to KM.

Organizational factors

Apart from the individual factors, external factors existed within the organizations also affect individuals' willingness to share information. These factors include Shadow of future, i.e., the opportunity of employees working together, Conformity pressure and Anonymity of the system.

Shadow of future

Increase in expectation of contact with others in the future would encourage participants to contribute in a public goods dilemma (Komorita & Parks, 1994). Repeated trials in a social dilemma game indicate the effect of shadow of future. However, within organizations, it may be defined as the chance to work with other colleagues in the future. Different organizations might require their employees to have different levels of contact or cooperation. Individuals who expect to meet other colleagues in the future would be more likely to share their knowledge with colleagues, due to the shadow of future.

H6: If individuals expect that they will work with colleagues in the future, they will be more likely to (a) contribute and (b) have higher intentions to contribute their knowledge at present.

Conformity

Research shows that a person's behaviors can be affected by others' (Komorita & Parks, 1994). In a common resource pool dilemma, Samuelson, Messick, Rutte, and Wilke (1984) found that the knowledge of the range of harvest of a group would affect the amount of harvest each group member made. If the range of harvest is

large within a group, group members were less likely to follow the group norm of the amount of harvest and vice versa. In other words, participants would follow the norm if the conformity pressure is high, i.e., when the variance of the group harvest is low.

Culture within the organization might help encourage employees to share information. Such cultures would also create a normative pressure from colleagues. Those colleagues who have favorable attitudes towards KM would exert peer pressure on participants within the work group. This conformity pressure would exert a certain degree of force on participants to share their own knowledge. Apart from the conformity pressure, individuals tend to reciprocate what others do (Clarke & Rollo, 2001), thus an organizational culture of knowledge sharing would help enhance knowledge sharing behaviors.

H7: Within an organizational culture that encourages sharing of information, individuals will be more likely to conform to the norm of (a) sharing own knowledge and (b) have higher intention to contribute their knowledge.

Anonymity of the system

In a public goods dilemma, if members stay anonymous in the group, they are

less likely to contribute their resources to sustain the public good (Olson, 1965). This is because they would be less likely to be identified as free-riders. In the case of KM, the issue of anonymity might be a bit different. Some means of knowledge sharing would allow the participants to be recognized easier by others, for example, teaching a new colleague about work procedure in front of other colleagues, while other means might be less likely to be recognized by others such as replying colleagues' email on work-related problem. Thus anonymity might affect how willing individuals participate in KM.

H8: The level of perceived anonymity will affect individuals' (a) actual knowledge sharing behaviors and (b) the intentions to engage in KM.

Past behaviors and Future behavioral intentions

Knowledge sharing behaviors in an organization could be manifested in different ways such as an employees teaching colleagues how to deal with a work-related problems or an individual sharing a newly known skills to deal with a work task with team members. Some of these manifestations involve active engagement as in the case of taking initiative to share with others whereas others involve individuals answering others' queries in the case of teaching a colleague

who asks for help. Thus past KM behaviors and future intentions of KM behaviors were distinguished into 2 groups of behaviors, which are active behaviors and passive behaviors.

According to the model of goal-directed behavior (Perugini & Bagozzi, 2001), the frequency of past behaviors predicts the future intentions of individuals. Thus we hypothesize that the past behaviors of knowledge sharing of participants predicts their future intentions to engage in KM.

H9: Individuals' past behavior of KM will be able to predict their future behavioral intentions to engage in KM activities.

Conclusion

When the KM is viewed through a social dilemma perspective, both individual and organizational factors are hypothesized to have potential effect on employees' willingness to share knowledge with colleagues within the organization. However, not much research has looked at these factors together. This paper aims at studying the different factors from a social dilemma perspective and investigating their effect on individuals' KM behaviors. The proposed model is shown in Figure 1.

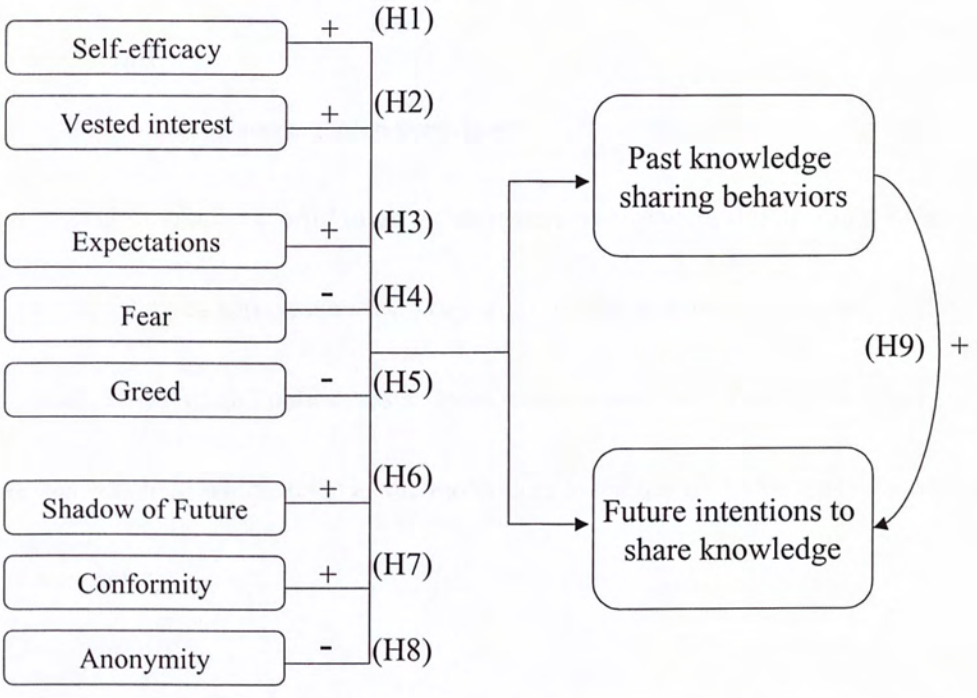

Figure 1. Proposed model of factors contributing to KM intentions and behaviors.

CHAPTER 2. METHOD

Participants

Two hundred and eighteen participants were recruited through convenience sampling. Invitations to fill in an online questionnaire were sent through Email to friends, relatives and classmates. They were invited to forward the email to their friends, relatives and colleagues as well. A lucky draw with four 1000-dollar cash prizes was held which acted as the motivators to encourage participants to take part in this survey.

Questionnaire

The questionnaire is divided into 4 parts. Firstly, participants were asked about their past behaviors of knowledge sharing. Secondly, they were asked to indicate their future intentions to engage in KM behaviors by indicating their agreement with the statements. In the third part of the questionnaire, the statements related to different factors affecting KM behaviors are shown. Three items were reverse coded in this section to check for reliability and consistency. The order of statements was randomized. Lastly, participants needed to fill in demographic information and contact information if they wanted to participate in the lucky draw.

As it was speculated that asking past behaviors and future intentions of KM before the statements of the 8 factors might affect participants' responses by stimulating their memories. The order has been counterbalanced by having about

half of all participants filled in the questionnaire with the statements relating to the 8 factors, followed by the past behavior, future intentions and demographic information.

Measures

The questionnaire is in Chinese and all items were self-developed by the researcher for this study. The number of items in each measure ranges from 5 to 14. Apart from the scale on past behavior, all other scales required participants to rate items according to their degree of agreement with the items in a 5-point Likert scale ranging from "strongly disagree" to "no comment" to "strongly agree". For the scale of past behaviors, participants were required to rate the statements in terms of their frequency of carrying out the behaviors, thus rating the statement in a 5-point Likert scale ranging from "never" to "always". Twenty-three items were reverse coded to avoid the acquiescence bias. The option of "not applicable" was given for participants who found the statements describing a situation that was not applicable at their work setting. All items are included in Appendix I.

Past behaviors related to KM. The first measure asks participants to rate different KM behaviors according to how frequently they have engaged in those behaviors. Nine examples of knowledge behaviors are used, including items such as "replying queries of colleagues by email" and "take initiative to share what one has learnt at work".

Future intentions to engage in KM behavior. Nine examples of KM behaviors are presented in this scale. Unlike the past behavior scale, participants were asked to indicate whether they agree with the items which describe situation in which they would engage in KM behaviors. Sample items are "I will teach other colleagues work-related skills" and "I will share my newly learnt knowledge with my colleagues".

Self-efficacy. There are 14 items in this scale. Examples of items include "my knowledge helps colleagues finish their work" and "my knowledge is important for the company".

Vested interest. A total of 12 items were included in this scale. Item examples include "I will ask other colleagues for help when I encountered problem at work" and "the knowledge of other colleagues is not useful for me at all".

Expectations. Five items were included in this measure. The examples of items include "I do not think other colleagues would remind me about work-related issues in the future" and "colleagues who are taught on work-related issues by others would teach other colleagues in the future".

Shadow of future. This scale consists of 7 items. Sample items include "I seldom work with other colleagues" and "I would not share my knowledge with colleagues whom I do not have much chance to work with in the future".

Fear. This scale consists of 8 items related to the fear variable. Examples of items include "I would be worse off if other colleagues do not teach me work-related knowledge after I did so" and "it is unfair if only I share with others the tips at work".

Greed. Nine items have been developed for this scale. Sample items include "it gives me the most advantage when I am taught by colleagues at work while I do not need to teach others" and "I do not like to teach other colleagues at work".

Conformity. There are 6 items included in this measure to assess the conformity variable. Sample items include "I will follow the way other colleagues work" and "it is important to gain acceptance from other colleagues".

Anonymity. An 8-item measure was developed to assess the influence of anonymity on participants' KM behaviors. Sample items include "colleagues would remember who had helped them on work-related issues" and "colleagues would pay attention to whether I have helped other colleagues".

CHAPTER 3. RESULTS

Validity analysis

Firstly, missing data was found in 4 sets of data which were then discarded.

Secondly, 3 items were duplicated in the questionnaire in the reverse direction for consistency and reliability checking. Reliability and consistency were judged by calculating the discrepancy between the items and their duplications. As the items were not directly duplicated, the items and the corresponding duplicated versions were not the same, thus a less conservative criterion was used for consistency checking. The criterion is that responses would be regarded as inconsistent and unreliable if the discrepancy of 2 out of the 3 sets of items is greater than 1. After the consistency and reliability check, 12 sets of data were discarded due to inconsistent and unreliable responses. The remaining usable data consisted of 202 respondents in total. The correlation table of variables was shown in figure 2.

Variable	Correlations								
	Mean	SD	1	2	3	4	5	6	7
1. Self-efficacy	53.188	7.074							
2. Vested Interest	46.886	5.439	.201**						
3. Expectations	18.327	2.634	.339**	.457**					
4. Fear	18.322	4.163	-.117	-.302**	-.498**				
5. Greed	17.960	4.501	-.307**	-.305**	-.306**	.611**			
6. Shadow of future	20.658	3.684	.207**	.261**	.096	-.085	-.020		
7. Anonymity	20.609	3.752	-.055	-.128	-.188**	.090	.074	-.207**	
8. Conformity	23.446	2.839	.111	.455**	.276**	-.003	-.101	.331**	-.115

*significant at .05 level (2-tailed) ** significant at .01 level (2-tailed)

Figure 2. Correlation table of variables

Demographic variables

Among the total 202 participants, 137 women and 65 men participated in this survey. The age of participants ranged from 18 to 60 with the mean age of 29.48. All of the participants had obtained secondary education or higher and most of the participants achieved tertiary education or above (73.3%).

In terms of occupation, the majority of the participants worked in the community, social and personal services sector (33.7%) and others worked in the financial institutions and insurance sector (17.8%) and wholesale, retail and import/export trades sector (16.3%). The participants have worked as full time ranging from 1 month to 43 years.

Dimensionality

To test the dimensionality, the scales were put into the confirmatory factor analysis. A model would be regarded as having a good fit if CFI was larger than .90 (Gefen, Straub & Boudreau, 2000). The scales of Past KM behaviors and Future intentions to engage in KM fit well into a 2-dimensional model. It matches with the proposed active and passive KM behaviors. On the other hand, the scales of the 8 variables, including Self-efficacy, Vested Interests, Expectations, Fear, Greed, Shadow of Future, Conformity and Anonymity fit well into a 1-dimensional model. Thus the sum of the scales was used in the structural equation modeling (SEM) testing.

Reliability

The reliability of all the scales was assessed and ranges from .59 to .90, which are regarded as satisfactory to good. The Cronbach's alpha of the scales are as follows, *Past KM behaviors* (9 items, $\alpha = .90$), *Future intentions to engage in KM behaviors* (9 items, $\alpha = .88$), *Anonymity* (8 items, $\alpha = .70$), *Conformity* (6 items, $\alpha = .59$), *Expectation* (5 items, $\alpha = .67$), *Fear* (8 items, $\alpha = .72$), *Greed* (9 items, $\alpha = .82$), *Vested interest* (12 items, $\alpha = .83$), *Self-efficacy* (14 items, $\alpha = .84$) and *Shadow of future* (6 items, $\alpha = .68$).

Model testing results

The hypothesized model was tested by the structural equation modeling (SEM) approach. The composite score of each scale are used for analysis. The proposed model does not give a satisfactory model fit ($\chi^2 = 100.45$, $df = 24$, $p < .05$; CFI = .901), thus some correlations among factors were deleted according to the Wald Test. The correlations deleted include correlations between Anonymity and Self-efficacy, Anonymity and Fear, Conformity and Fear, Shadow of Future and Fear, and Shadow of future and Expectations. The model was further improved by removing some paths according to the Wald Test result until no further improvement could be made by deleting any paths. The paths from Vested Interest, Expectations, and Conformity to Past Behaviors and from Anonymity to Future Intentions were deleted. After the edition, the final model eventually has a satisfactory model fit (χ^2

= 80.71, df = 24, p < .05; CFI = .911). The final model with all standardized path coefficients was shown in Figure 3.

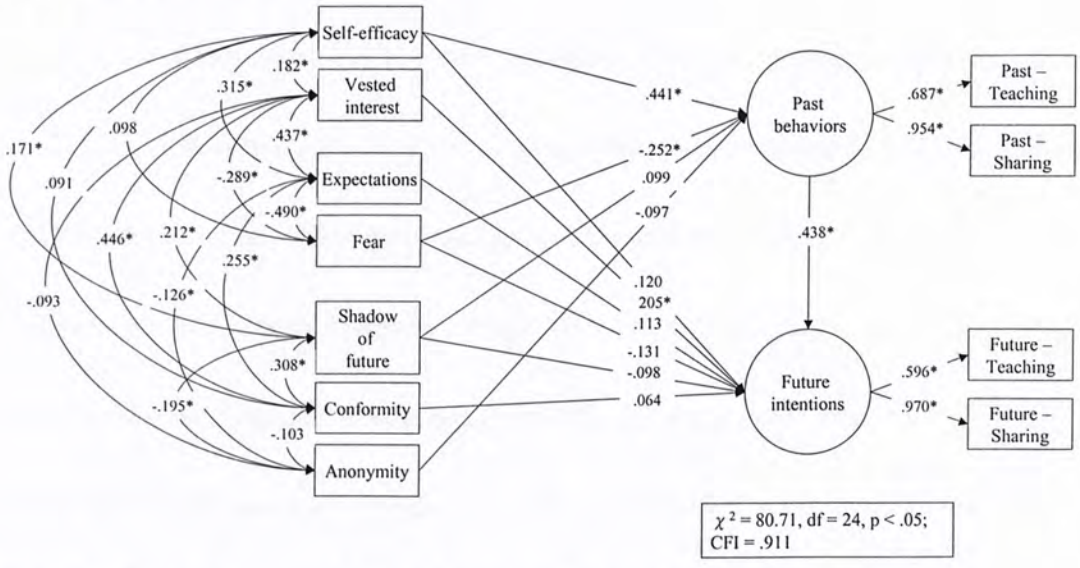

Figure 3. Result of structural equation modeling. (Significant paths were marked with *.) (For simplicity the error terms and the measurement paths were not shown.)

Hypothesis testing

Hypothesis 1 and 2 concern about the intrapersonal factors affecting individuals' intentions and actual knowledge sharing behaviors. In brief, Hypothesis 1 and 2 state that individuals with higher Self-efficacy in their own knowledge or higher Vested Interest in KM would be more likely to participate in knowledge sharing respectively. The result showed that the path from Self-efficacy to Past Behavior is significant, thus Hypothesis 1a is supported and 1b is not supported. On the other hand, the path from Vested Interest to Future Intentions is significant while the path to Past Behaviors has been dropped, thus Hypothesis 2a is not supported but 2b is supported.

Hypothesis 3 to 5 concern about the interpersonal factors that affect individuals' intentions and KM behaviors. Hypotheses 3 suggested that levels of Expectations of individuals towards other colleagues' knowledge sharing behaviors would be positively related to their behaviors and intentions to engage in KM. The path from Expectations to Future Intentions is not significant while path to Past Behaviors has been dropped, thus both Hypotheses 3a and 3b are not supported. Hypotheses 4 and 5 stated that Fear and Greed of individuals would negatively affect their intentions and actual behaviors to engage in KM. The result shows that only the path from Fear to Past Behaviors is significant but the path to Future Intention is not significant, thus Hypothesis 4a is supported and 4b is not supported. The factor Greed has been deleted to improve model fit during the model testing process, thus this factor is removed, Hypotheses 5a and 5b are not supported.

Hypothesis 6 to 8 concern with the organizational factors which affect individuals' KM behaviors and future intentions. Hypothesis 6 suggested that if the employees within an organization were likely to work together, they would be more likely to have future intentions to and actually participate in KM activities. Results showed that the paths from Shadow of Future to Past Behaviors and Future Intention were not significant, thus both Hypotheses 6a and 6b are not supported. Hypothesis 7 suggested Conformity pressure to have a positive impact on individuals' behaviors

and intentions to engage in knowledge sharing while Hypothesis 8 stated that Anonymity would negatively affect individuals' intentions to engage and actual KM behaviors. The paths from Conformity to Future Intentions and from Anonymity to Past Behaviors are not significant while the paths from Conformity to Past Behaviors and from Anonymity to Future Intentions were dropped, thus both Hypotheses 7a, 7b, 8a and 8b are not supported.

Hypothesis 9 suggested that past behaviors of participants could predict their future intentions to engage in KM behaviors. Result showed that the path from Past Behavior to Future Intention was significant, thus hypothesis 9 was supported.

CHAPTER 4. DISCUSSION

The purpose of this study is to investigate individuals' intention and actual participation in KM activities from a social dilemma perspective. The factors affecting participants' behaviors in social dilemmas were studied to see if they would affect knowledge sharing behaviors in organizational settings, basing on the belief that knowledge can be regarded as a public good. The results indicated that some factors were more crucial in affecting participants' knowledge sharing behaviors than others. Seldom has research on social dilemma included all factors in one study. Thus this study might discover some crucial factors affecting the contribution to KM of individuals.

It was found that the KM behaviors could be categorized into active and passive behaviors, as hypothesized. Nevertheless, surprisingly, different factors were found to predict past behavior and future intentions to take part in KM. Past behaviors were affected by Self-efficacy and Fear. Thus, individuals who have higher self-efficacy in the usefulness of their knowledge to others as well as those who have higher level of fear towards others free-riding reported more frequent participation in KM activities. Future intentions were affected by Vested Interest. Thus, individuals to whom the knowledge is relatively more important reported higher intentions to engage in KM activities in the future.

It is interesting that there is difference among the factors affecting either past behaviors or future intentions of knowledge sharing. From the proposed model, it was suggested that factors which affect past behaviors should also affect future intentions. However, the result of model testing shows that 3 of the 8 factors were more crucial to affect either or both past behaviors and future intentions. Moreover, Self-efficacy and Fear have an indirect effect on future intentions. Thus it could be concluded that 3 of the 8 factors significantly predict individual's intentions to participate in KM activities in the future.

Factors affecting past behaviors

Only 2 factors, Self-efficacy and Fear could predict KM behaviors in the past. It is surprising as it was expected that the significant factors predicting past behaviors would also be able to predict future intentions as well. The current results revealed the fact that what predicts intentions well might not be a good predictor for actual behaviors. Thus factors which affect behaviors and intentions should be distinguished clearly. However, for organizations which emphasize KM, it is important to ensure that employees actually share knowledge with colleagues. Having intentions would be insufficient if actual behaviors were not carried out, and the benefits of KM could not be realized.

Fear

As to encourage more employees to participate in KM activities, organizations

might want to focus on the factors of Fear and Self-efficacy as they significantly predict knowledge sharing behaviors in the past. Fear refers to the worry of employees that other colleagues would take advantage of them by free-riding. Past research usually included fear and greed in a study. However, greed is not a significant predictor of past behaviors in this study. This might be due to the strong group identity of employees towards the group of colleagues (e.g. work teams, department). Simpson (2006) proposed a refined model to explain the effect of group identity on cooperation in social dilemma. He found that group identity reduced the effect of greed on cooperation but has no effect on the fear component. Thus fear could affect the cooperation, i.e. knowledge sharing behaviors, even with a strong group identity of participants while the effect of greed might be reduced by the group identity.

To reduce such fear, organizations might need to develop a culture of knowledge sharing within the organizations. It might be more than having a few training workshops. The management needs to set an example by sharing knowledge, they have to explain the importance and benefits of knowledge sharing to both the organizations and employees. When this culture has been developed, knowledge sharing behaviors within the organizations would be reciprocated, thus increasing the confidence of employees that others would help and share their knowledge when

colleagues are in need.

Self-efficacy

Self-efficacy is an important factor influencing individuals' behavior in public goods dilemma (Messick, 1973; Olson, 1965) as it was found to affect participants' past KM behaviors. Believing that one's work-related knowledge is able to help others to handle their problem is an important pre-requisite for employees to carry out the behaviors. De Cremer and van Vugt (2001) found that in a social dilemma game with group identity emphasized, it was self-efficacy rather than trust which could mediate the effect of group identity on contributions of participants. Self-efficacy is an important factor that determines whether the individuals would be willing to share their own knowledge (Cabrera, Collins & Salgado, 2006). Therefore it is essential for employees to build up such efficacy belief to encourage the employees to share their knowledge with colleagues.

As to enhance the self-efficacy of employees to share their knowledge, organizations could recognize the knowledge sharing behaviors of employees such as considering it as one of the attributes in the performance appraisal process. By doing so, supervisors are encouraged to monitor such behaviors of employees, thus they could feedback on their KM behaviors. This helps reinforce appropriate knowledge sharing behaviors and might also help creating a knowledge sharing culture, which would both reduce fear and increase self-efficacy of employees, thus

increasing the KM behaviors.

Factor affecting future intentions

Despite the crucial roles of Self-efficacy and Fear in encouraging behaviors of knowledge sharing, another significant factor which is Vested Interest should not be overlooked. This study investigated the effect of 8 factors on past behaviors and future intentions, apart from behaviors in the past, we were also interested in participants' intentions to engage in KM in the future. As future behaviors could not be assessed via survey at this point of time, considering both past behavior and future intention would be a more reliable indicator of future behaviors. According to the model of goal-directed behavior (Perugini & Bagozzi, 2001), past behavior would affect intentions while both past behavior and intentions would affect the actual action taken. Therefore, organizations which would like to enhance organizational KM behaviors should also consider the measures to enhance employees' intentions.

Vested Interest

Individuals who perceive the knowledge shared to be important to them would intend more to share their knowledge. Perceiving the knowledge to be important to them, individuals would be more willing to share their knowledge as they have more to gain. Therefore, having a lecture for employees to learn the importance of knowledge sharing for each of them could raise their awareness of the importance as

well as the benefits of KM. It would also raise their level of vested interests, thus encouraging them to share their knowledge, enhancing their future intentions.

Conclusions

Three factors were found to affect either past behaviors or future intentions or both, among which the 2 intrapersonal factors could significantly predict either the behaviors or the intentions whereas all organizational factors were found to be non-significant as to predict either past behaviors or future behavioral intentions to engage in KM activities.

Knowledge sharing involves one to share their own knowledge to others, thus it is much related to one's own perception of one's ability, i.e., Self-efficacy and the perception of the importance of knowledge from others, i.e., Vested Interest. However, the factors out of the employees' control, i.e. the Shadow of Future, Conformity pressure and Anonymity of KM, could not help predict the intentions and behaviors of knowledge sharing. Moreover, the condition in organizations is different from the previous social dilemma research which took place in small experimental group. Within an organization, a larger group of members were involved, individuals might not know the work of each other. Thus, such organizational factors might not be that crucial in current study.

Nevertheless, a more complex situation exists within the interpersonal factors.

Only Fear could significantly predict participants' behavioral intentions to participate in KM activities. The remaining factors, i.e., Expectations, could not establish a significant relationship with both the behaviors and intentions.

Expectations could not predict KM behaviors and intentions. Expectations of others' KM behaviors would depend on a few factors including how well the individual knows the organizational culture, their colleagues and so on. The size of the company might also affect the expectations formed by the employees. Working in a large group or team of colleagues would be more difficult for the individuals to know the knowledge possessed by other colleagues. Thus, it would be less likely for them to form a clear expectation of the KM behaviors of colleagues.

Implications

As the world changes so quickly, organizations have recognized the need to emphasize management of knowledge to retain their comparative advantage to outcompete the competitors. However, the success of KM within an organization is not solely dependant on the implementation of a system, rather it is also heavily dependant on the people element. Thus this study tried to entangle the complexity of the relationship among factors which affect individuals' contribution to KM, from a social dilemma perspective.

The results of this study show that 3 of the 8 factors were found to affect individuals' intentions and behavior to engage in KM activities. Organizations could

focus on these 3 factors, Fear, Self-efficacy and Vested Interest, to enhance the effectiveness of organizational KM. As to reduce fear and enhance employees' expectations, organizations could consider bringing up an atmosphere and a culture of knowledge sharing within organizations. Such practices could reduce employees' fear that others would not reciprocate their knowledge sharing behaviors.

Furthermore, organizations could set up an official forum for employees to share their knowledge with others. Moreover, it might be useful to consider knowledge sharing with other colleagues in the performance appraisal process. Giving feedback to employees on their performance in this aspect could help reinforce their good performance and build up their self-efficacy of sharing of knowledge.

Limitations

As suggested before, firstly, one of the limitations of this study is that future behavior has not been assessed to ensure a direct link from past behavior and future intentions to future behaviors. Future research could consider collecting responses after a period of time after the first responses to ensure the link to actual behaviors. Nevertheless, according to the model of goal-directed behavior (Perugini & Bagozzi, 2001), past behavior and intentions would affect the actual action taken. Thus, we have good reason to believe that future behaviors would be affected by the 3 significant factors. Secondly, the convenience sampling might weaken the

generalizability of the study as invitation to participate in this survey is forwarded by personal network only. Thus future research might consider a more systematic method of sampling to ensure the generalizability to the population. Thirdly, the criterion used for consistency checking may be arbitrary. However, due to the small size of the sample, a less conservative criterion is used. Future research might recruit a larger size of sample while using a more conservative criterion to ensure better consistency checking. Fourthly, moderating factors might be considered, such as working experience in the field. Such variables might contribute to the self-efficacy of individuals to contribute their knowledge. Lastly, empirical research could be done to verify the effectiveness of the suggested intervention to enhance employees' intentions and participation to engage in KM activities.

KM is an important topic of research to improve the KM practices among organizations. It is also important for organizations to keep their comparative advantage against their competitors. Researchers might focus on the factors which enhance employees to participate in these activities and to develop effective measures to encourage them to share their knowledge. Practitioners and researchers should go hand in hand to carry out field study to narrow the gap of theoretical framework and field setting, thus to achieve the most beneficial outcome, a win-win situation, to fully realize the importance and benefits brought by KM.

Appendix I

Past Behaviors	
Teaching	
Past-passive1	教導新入職的同事工作相關的知識。
Past-passive2	幫助在工作上遇到問題的同事。
Past-passive 3	回答同事們有關工作難題的電子郵件。
Past-passive 4	指導向我請教的同事。
Sharing	
Past-active1	與公司的同事分享新學到的知識。
Past-active2	主動跟同事分享有關工作上的秘訣。
Past-active3	教導其他同事工作相關的技巧。
Past-active4	告訴我的同事我在工作上的心得。
Past-active5	跟同事分享我認爲有助於他們工作的小貼士。
Future Intentions	
Teaching	
Future-passive1	我會教導新入職的同事工作相關的知識。
Future-passive2	我會幫助在工作上遇到問題的同事。
Future-passive3	我會回答同事們有關工作的難題的電子郵件。
Future-passive4	我會指導向我請教的同事。
Sharing	
Future-active1	我會與公司的同事分享新學到的知識。
Future-active2	我會主動跟同事分享有關工作上的秘訣。
Future-active3	我會教導其他同事工作相關的技巧。
Future-active4	我會告訴我的同事我在工作上的心得。
Future-active5	我會跟同事分享我認爲有助於他們工作的小貼士。
Self-efficacy	
Self-efficacy1	我的知識能幫助同事們完成工作。
Self-efficacy2	若同事在工作上遇到問題，我懂得幫助他們解決問題。
Self-efficacy3	我能提供資訊給新入職的同事以幫助他適應新環境。
Self-efficacy4	我可以在小組/部門/團隊會議上提出有助公司利益的意見。
Self-efficacy5	我有一些同事所缺乏的有關工作的知識。
Self-efficacy6	我的知識對公司很重要。
Self-efficacy7	我的知識和經驗可改善同事們的工作。

Self-efficacy8	同事們能從我所分享的心得中獲益良多。
Self-efficacy9	若我跟同事們分享我的心得，他們的工作可更順利。
Self-efficacy10	我沒能力幫助其他同事解決工作上的難題。
Self-efficacy11	我的知識或經驗不能令同事有所得著。
Self-efficacy12	我沒有能力幫助向我請教的同事。
Self-efficacy13	我的知識或經驗不能爲其他同事帶來任何工作上的好處。
Self-efficacy14	我的知識令同事工作更方便。

Vested Interest	
Vested Interest1	我在工作上遇到難題時會向同事請教。
Vested Interest2	其他同事曾教導我工作上的知識。
Vested Interest3	同事們的知識對我的工作很重要。
Vested Interest4	我從部門/團隊/小組會議/討論中能學習有用的知識和資訊。
Vested Interest5	若沒有同事的教導，我便不能完成我的工作。
Vested Interest6	同事們的知識能幫助我把工作做得更好。
Vested Interest7	藉著同事們的指導，我能更順利地工作。
Vested Interest8	同事們在工作上對我的提點能令我順利完成工作。
Vested Interest9	爲了完成工作，我必須請教其他同事。
Vested Interest10	與同事交流工作上的心得和秘訣對我的工作有很大裨益。
Vested Interest11	當我在工作上遇到問題時，可以從同事間獲得有用的知識和資訊。
Vested Interest12	同事們的工作知識對我的工作毫無用處。

Expectations	
Expectations1	同事們會指導曾經提點他們的同事。
Expectations2	其他同事都會與別人分享自己在工作上的小秘訣。
Expectations3	我不相信同事們在未來會在工作上提點我。
Expectations4	同事們在獲得其他人的提點後也會提點其他同事。
Expectations5	曾受別人指導的同事不會指導其他同事。

Fear	
Fear1	若我分享了我的心得而同事們卻守口如瓶，我便會吃虧。
Fear2	在我有需要時同事們不會教導我。
Fear3	其他同事會否與我分享心得，也不會影響我會否跟他們分享我的心得。
Fear4	只有我跟別的同事分享工作秘訣對我不公平。

Fear5	我介意在工作上被佔便宜。
Fear6	別人不會分享工作上的秘訣。
Fear7	教曉同事們會令我吃虧。
Fear8	我所分享的心得不能幫助他人。

Greed	
Greed1	對我最有利的就是能夠得到同事的指導，而不需指導他人。
Greed2	我想知道別人的工作秘訣，而我又不願透露我的心得。
Greed3	跟同事分享工作上的秘訣是浪費時間。
Greed4	我不會跟曾指教我工作的同事分享工作心得。
Greed5	我只想同事跟我分享工作上的心得，而我不用跟他們分享。
Greed6	在指導新同事時，我不在乎他/她在未來會否幫助我。
Greed7	若能在小組/部門/團隊會議上聆聽同事分享經驗，而我又不用分享，令我更成功。
Greed8	我只喜歡聽取別人的心得，不喜歡分享自己的心得。
Greed9	我不喜歡教導其他同事工作。

Shadow of Future	
Shadow of Future1	我和同事很少機會一起工作。
Shadow of Future2	同事之間在工作上很少機會接觸。
Shadow of Future3	我的工作不需要與同事們有任何的合作。
Shadow of Future4	同事們之間有很多機會接觸和合作。
Shadow of Future5	我不會與將來沒有機會合作的同事分享工作上的心得。
Shadow of Future6	我告訴新同事工作上的秘訣是因爲在未來我們有很多機會接觸。

Conformity	
Conformity1	能否融入工作小組/團隊/部門是一件很重要的事。
Conformity2	得到同事的接納對我很重要。
Conformity3	我重視別的同事對我的看法。
Conformity4	我重視與同事間的關係。
Conformity5	我會跟從其他同事的做法。
Conformity6	與同事處事手法不同對我是無關重要的。

Anonymity	
Anonymity1	同事們會記得誰曾在工作上指導過他們。

Anonymity2	同事們會記得我有否在小組/團隊/部門會議上分享過我所知的。
Anonymity3	同事們會留意到我有否教導過其他同事。
Anonymity4	同事們不會記得我曾否在工作上提點過他們。
Anonymity5	同事們會記著誰曾指導過他。
Anonymity6	新同事不會忘記我曾否指導過他/她。
Anonymity7	同事會分享曾被其他同事指導的經驗。
Anonymity8	教導其他同事工作時會加深同事對我的印象。

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